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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/596,549	06/19/2000	Andrew Booth	H-525US	2122

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EXAMINER

LUK, EMMANUEL S

ART UNIT	PAPER NUMBER
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1722

6

DATE MAILED: 04/25/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

TP-6

Office Action Summary

Application No.

09/596,549

Applicant(s)

BOOTH ET AL.

Examiner

Emmanuel S. Luk

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 19 June 2000.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) 23-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 13-22 and 28 is/are rejected.
- 7) ☒ Claim(s) 10-12 is/are objected to.
- 8) ☒ Claim(s) 1-28 are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 June 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2,4.
- 4) ☒ Interview Summary (PTO-413) Paper No(s). 5.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-22 and 28, drawn to an Apparatus, classified in class 425, subclass 542.
 - II. Claims 23-27, drawn to a Method, classified in class 264, subclass 328.15.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions Group II and Group I are related as process and apparatus for its practice. The inventions are distinct if it can be shown that either: (1) the process as claimed can be practiced by another materially different apparatus or by hand, or (2) the apparatus as claimed can be used to practice another and materially different process. (MPEP § 806.05(e)). In this case, the process can be practiced by another materially different apparatus with the contact pad soldered or brazed to the connector housing.
3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.
4. During a telephone conversation with Dawn Hayes on April 1, 2002, a provisional election was made with traverse to prosecute the invention of Group I, claims 1-22 and 28. Affirmation of this election must be made by applicant in replying to this Office

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action. Claims 23-27 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Drawings

5. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(4) because reference character "34" has been used to designate both substrate (pg. 13, line 1) and contact pads (page 10, line 21), and "50" has been used to designate both resistive trace (page 10, line 32) and contact pads (page 16, line 2). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

6. The disclosure is objected to because of the following informalities:

On page 9, lines 6 and 28, "plan" view if misspelled.

On page 17, line 20, the term "full hard stainless steel" is indefinite.

Appropriate correction is required.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the

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invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

9. Claims 1-3, 8, 9, 14-19, 22 and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Juliano et al in view of Riley.

Juliano teaches a thick film heater for injection mold runner nozzle having a tubular body (32) with a tubular heater core applied on the surface. A dielectric layer and resistive element thick film layer covers the heater surface that are printed on (Col. 6, lines 22-23). Further, an acrylic glaze layer coats the layers, while lead termination pads are in contact with the dielectric layer. The nozzle is shown to be non-flat and cylindrical in the Figures.

Juliano fails to teach silk-screened dielectric layer and contact pads, insulation layer over restrictive layer, an annular connector housing for mechanical connection of a contact to each contact pad, ceramic housing, steel substrate and gold plated steel contact pad.

The acrylic glaze layer would act as an insulation layer on top of the resistive layer. The termination pads acting as contact pads are printed on (Col. 6, lines 61-61), the connector housing being a heater sheath (6) having wires that lead to the contacts.

Riley teaches a thick film circuit element having substrates and layers that are formed via silk screen (Col. 3, line 67) onto the surfaces of the substrate (12). The substrates can be made of ceramic (Col. 3, line 65), other substrates include stainless steel (Col. 2, lines 65-66) and noble metals, such as gold (Col. 1, line 41) for use in the circuit. Riley teaches the use of a variety of different materials in the substrates, this also suggests use in parts other than substrates including the housing and contact pads, such as a ceramic housing and gold plated steel on the contact pads.

In regards to claims 17-19, the dielectric strength of the dielectric layer, the insulation resistance and the thermal expansion coefficients are cause effective variables that can be determined through routine experimentation. It would have been obvious to one having ordinary skill in the art to have determined the optimum value of a cause effective variable such as through routine experimentation in the absence of a showing of criticality in the claimed properties such thermal expansion coefficient, resistance and dielectric strength. *In re Woodruff*, 16 USPQ2d 1934, 1936 (Fed. Cir. 1990).

It would have been obvious to one of ordinary skill in the art to modify Juliano with silk screen printing of layers and materials for the elements as taught by Riley because it provides improved layering of materials and conduction of heat.

10. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Juliano et al in view of Riley as applied to claims 1-3, 8, 9, 14-19, 22 and 28 above, and further in view of Schmidt.

Juliano fails to teach a longitudinal slot in the substrate.

Schmidt teaches a band heater clamp arrangement for an injection molding machine. Schmidt teaches an inner sleeve having an axial slot that extends through the entire length that allows for the inner sleeve to expand and close as temperature rises, thus allowing for the different thermal expansion rates between the inner sleeve and outer sleeve (Col. 2, lines 41-47).

It would have been obvious to one of ordinary skill in the art to modify Juliano with a slot as taught by Schmidt because it allows for heater to compensate for the thermal expansion of the substrate that is located on the inner sleeve.

11. Claims 5-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Juliano et al in view of Riley as applied to claims 1-3, 8, 9, 14-19, 22 and 28 above, and further in view of Collins.

Juliano fails to teach the resistive layer comprises of a resistive trace and a lower-resistance conductive trace.

Collins teaches the formation of a thick film resistor and utilizes a resistive layer and a low-resistance conductive trace:

Each of the networks was fabricated on insulative alumina substrates by direct writing of the resistive line pattern r using commercially available ruthenium-based inks of different compositions (different sheet resistivities), whereby each pattern was written to achieve a different final effective width of the line r for the resistor segments. Both segments of each resistor network were written with one and the same line width. The effective line widths of the low resistance segments were achieved by writing a selected number of resistive lines in a parallel configuration between conductive terminal bars connected to respective conductive terminations. (Col. 6, lines 15-26)

The low resistance segments being the conductive trace, thereby low resistance, that is located with resistive lines (resistive trace) that forms the resistive layer, the patterning allows for optimum use of the resistive layer.

It would have been obvious to one of ordinary skill in the art to modify Juliano with a resistive layer comprised of a resistive trace and a conductive trace as taught by Collins because it allows for optimum configuration for the resistive trace pattern in the heater.

12. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Juliano et al in view of Riley as applied to claims 1-3, 8, 9, 14-19, 22 and 28 above, and further in view of Goldwin (EP 0963829 A1).

Juliano fails to teach the connector housing having a key for slidably engaging a longitudinal slot in the substrate.

Goldwin teaches an injection molding heater around a nozzle (130) comprising of a thin film heater (132) that has a connector (138), or key, that ensures the heater stays connected to the nozzle (Fig. 14A). One skilled in the art recognizes the above view of the nozzle and heater that the connector would be in a slot of the heater for engagement. The connector and slot also inherently ensures proper alignment of the heater with the nozzle for any desired configuration such as aligning with contact pads.

It would have been obvious to one of ordinary skill in the art to modify Juliano with slot and key as taught by Goldwin because it ensures interchangeable heaters to the nozzle that can be aligned accordingly.

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13. Claim 20 is rejected under 35 U.S.C. 103(a) as being unpatentable over Juliano et al in view of Riley as applied to claims 1-3, 8, 9, 14-19, 22 and 28 above, and further in view of Shipley.

Juliano fails to teach photoforming.

Shipley teaches photoforming of a dielectric element (Col. 5, lines 31-35) in a multiplayer circuit board and the photoform of openings (Col. 5, lines 24-25). One skilled in the art would recognize the use of photoforming for producing a layer onto another, in this case the resistive layer onto the dielectric layer.

It would have been obvious to one of ordinary skill in the art to modify Juliano with photoforming as taught by Shipley because it provides a method of formation of layers with photoimaging that allows for formation of multilayers of higher density using photoimaging techniques (Col. 4, lines 23-30).

14. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Juliano et al in view of Riley as applied to claims 1-3, 8, 9, 14-19, 22 and 28 above, and further in view of Bottari et al.

Juliano fails to teach laser etching.

Bottari teaches the formation of a wire trace pattern with the use of laser etching or some other technique [0018]. One skilled in the art recognizes the employment of the well known technique of laser etching in the formation of integral wiring traces.

It would have been obvious to one of ordinary skill in the art to modify Juliano with laser etching as taught by Bottari because it provides a reliable and less labor intensive assembly can be formed.

Allowable Subject Matter

15. Claims 10-12 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

16. The following is a statement of reasons for the indication of allowable subject matter: The prior art of record fails to teach a heater having a substrate layer, a dielectric layer, resistive layer, contact pads and an insulation layer that contains a connector housing for contacting the contact pad to the resistive layer in mechanical connection and having a locking detent and locating hole on the substrate. The prior art of record, such as Juliano et al, does not teach the mechanical connection of the contact pads with the substrates by the connector housing. The pads are brazed or soldered thereby forgoing the need for a locking detent on the connector housing that connects with a locating hole on the substrate

Conclusion

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Kim, Riley, Johnson et al and Liou.

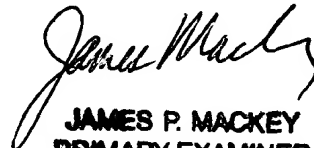
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18. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Emmanuel S. Luk whose telephone number is (703) 305-1558. The examiner can normally be reached on Mondays through Thursdays from 6:30 AM to 4:00 PM and alternate Fridays from 6:30 AM to 3:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nam X. Nguyen can be reached on (703) 308-3322. The Rightfax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

E. L.
April 22, 2002


JAMES P. MACKEY
PRIMARY EXAMINER
4/22/02